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Section 1 Menu Presentation Customization – Menu Modes

MUNIS® provides two distinct types of menu modes: Multiple Document Interface (MDI) and Single Document Interface (SDI). Each has its own distinct advantages:

- With MDI mode, all MUNIS forms open within one parent window
- While in SDI mode, each MUNIS form opens in its own independent window

If you execute the programs from a script, the mode MUNIS runs in is set by the database launching script; to switch between these two menu modes:

Open the appropriate launching script (i.e. genmunis)

Find the MU_MDIMODE variable

For MDI, it should be **\$MU_MDIMODE=1**

For SDI, it should be **\$MU_MDIMODE=0**

NOTE: If this variable is not present, simply add it.

Find the FGLRUN command at the end of the script

If it is set to MDI mode, it will look like this:

\$FGLRUN \$MU_ROOT/progs/memdimnu -i1

To change it to SDI, it should look like this:

\$FGLRUN \$MU_ROOT/progs/mesdimnu -i1

NOTE: The only change is the name of the program being called.

Save the file and launch MUNIS with the newly altered launching script. You should now be in the desired menu mode.

MDI Menu

The MDI presentation is shown in Figure 1. The grey screen acts as a shell, container or parent screen within which all MUNIS® programs will be executed. This format allows

the user to minimize and maximize all open MUNIS applications with a single click of the mouse.

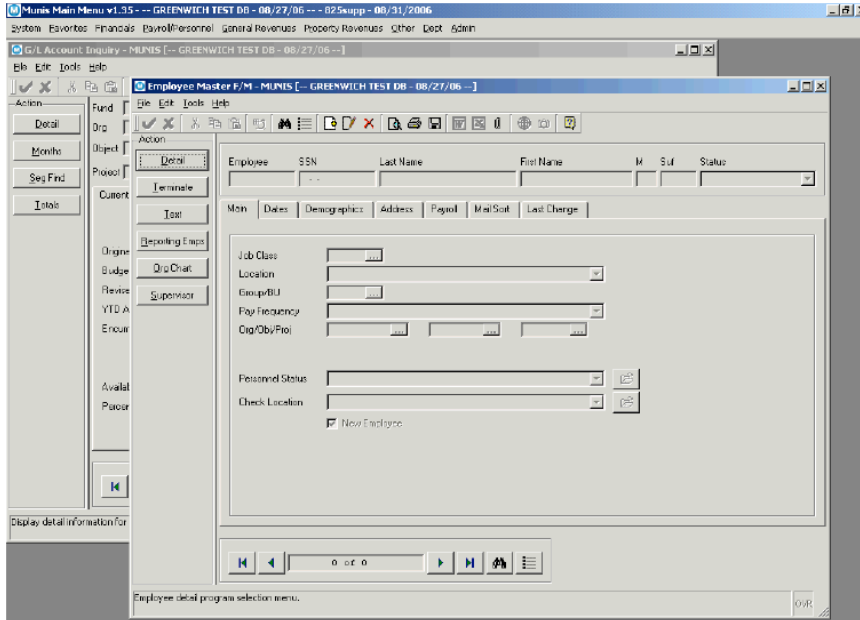


FIGURE 1

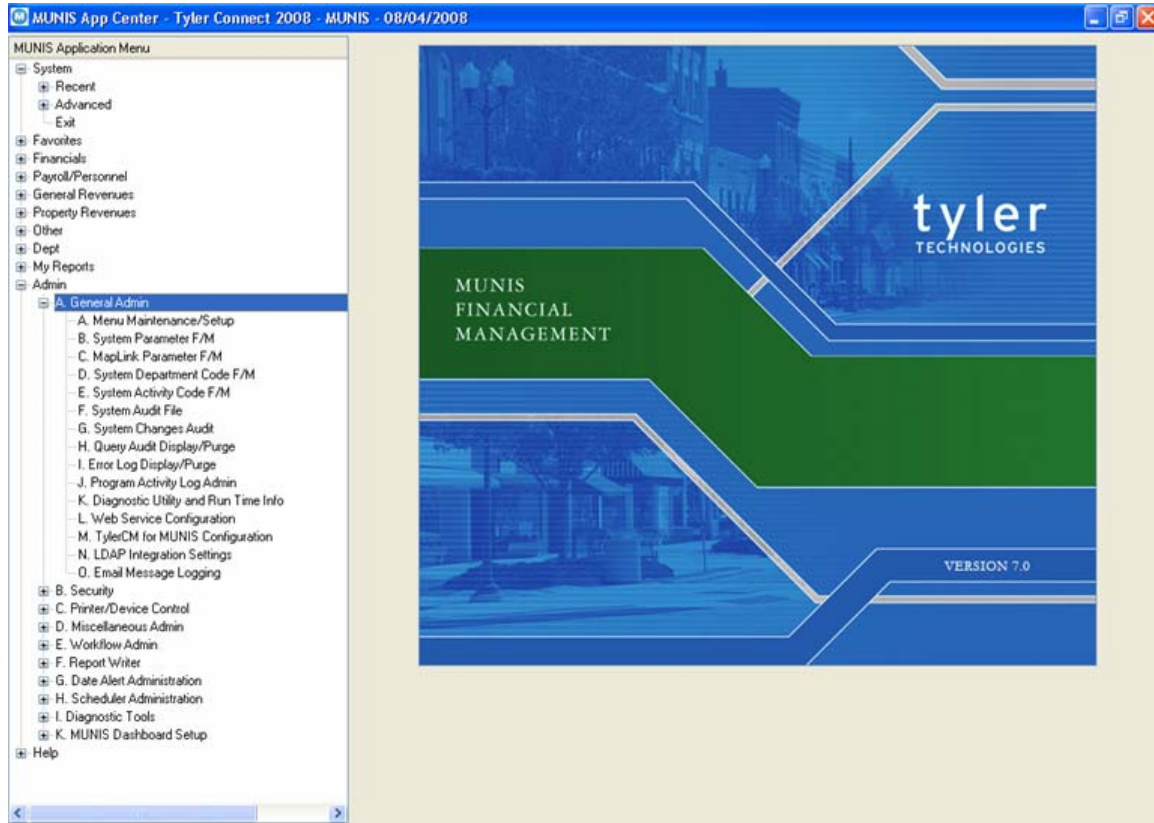
Closing the MDI menu system will shutdown all the executing MUNIS programs. Prior to closing, a pop-up window will appear to confirm shutdown. Despite this capability, MUNIS always recommends that each program be shutdown individually to ensure no processing is lost. When a user does select a forced shutdown, an entry is written to the error log.

SDI Menu

The SDI presentation, on the other hand, is a two-pane window that is shown in Figure 2. The menu system sits within the left-hand pane while the right-hand pane serves as an information center with a customizable image and hyperlinks. This version allows the

user to launch multiple MUNIS programs independently. Each can be minimized, maximized, and closed without disturbing the others.

FIGURE 2

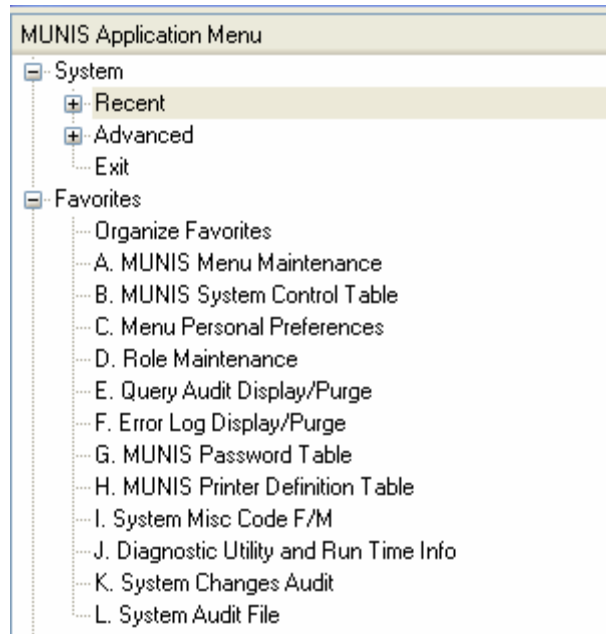


The user needs to take care during shutdown to ensure that all MUNIS programs have been exited. Because each window is an independent entity, there is no central control mechanism to evaluate what programs are running at any given time.

Favorites and Recent Menu

For both menu modes from a convenience perspective, the user is afforded a “Favorites” menu that allows frequently accessed programs to be launched without having to navigate through the menu system. In addition, under the “System” menu, there is a “Recent” menu that keeps a chronological list of the most recently executed programs (Figure 3).

FIGURE 3





My Menu

Once a program is launched, there is the menu option “My”. The “My” menu includes the user’s favorites, reports and menu preferences (Figure 4).

FIGURE 4



Add Favorites

Favorites can be added by selecting the star  icon on your MUNIS toolbar (Figure 5) or by right clicking on the program screen and choosing  + Favorites (Figure 6).

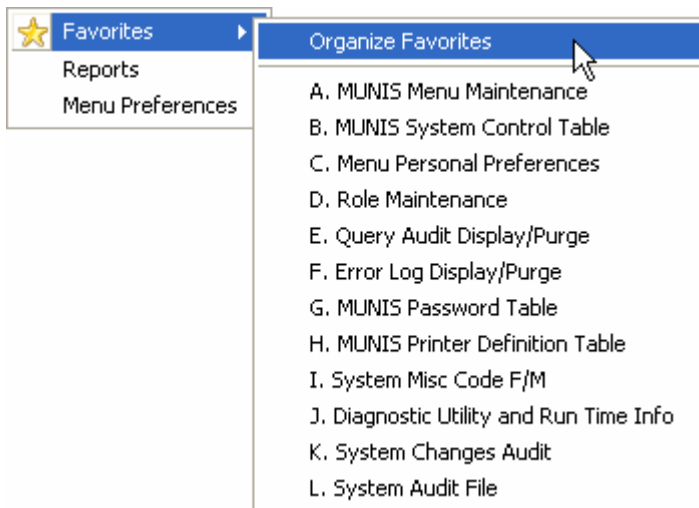


FIGURE 5

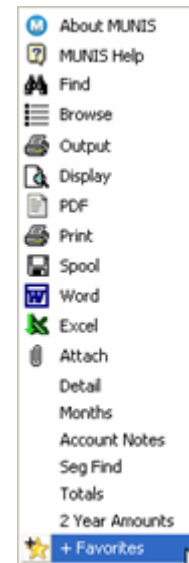


FIGURE 6

Remove Favorites

To remove a program from the Organize Favorites, select the program from “My” menu or from the MUNIS menu; then click on the Delete button (Figure 7).

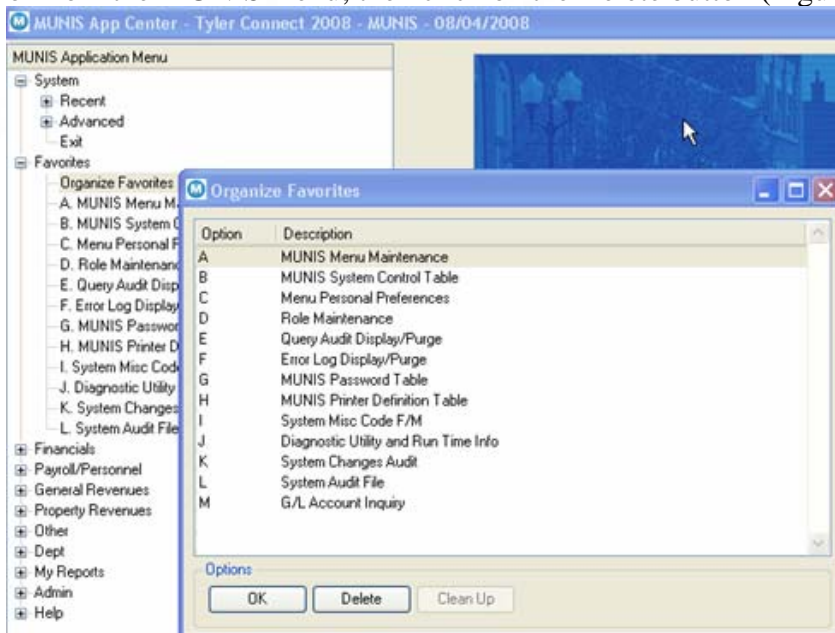


FIGURE 7

Section 2 Menu Style Preferences

MUNIS offers three different menu styles: “tree”, “pop-tree” (Figure 8), and “pull-down” (Figure 9).

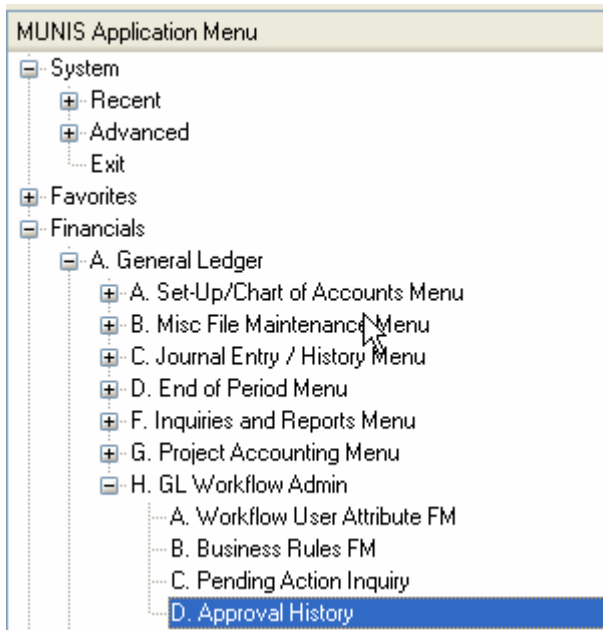


FIGURE 8

“Tree” and “Pop Tree” Menu

The “tree” and “pop-tree” styles are displayed above and follow the Windows Explorer standard (Figure 8). They allow the user to expand and collapse portions of the tree at will. The “tree” version stays docked on the left-hand side of the screen while the “pop-tree” version is free-floating and can be positioned anywhere. The “pop-tree” menu can be accessed at any time by pressing a user-defined function key. From a user’s perspective, the primary advantage of these two styles is that the menu stays open even after a program is selected.

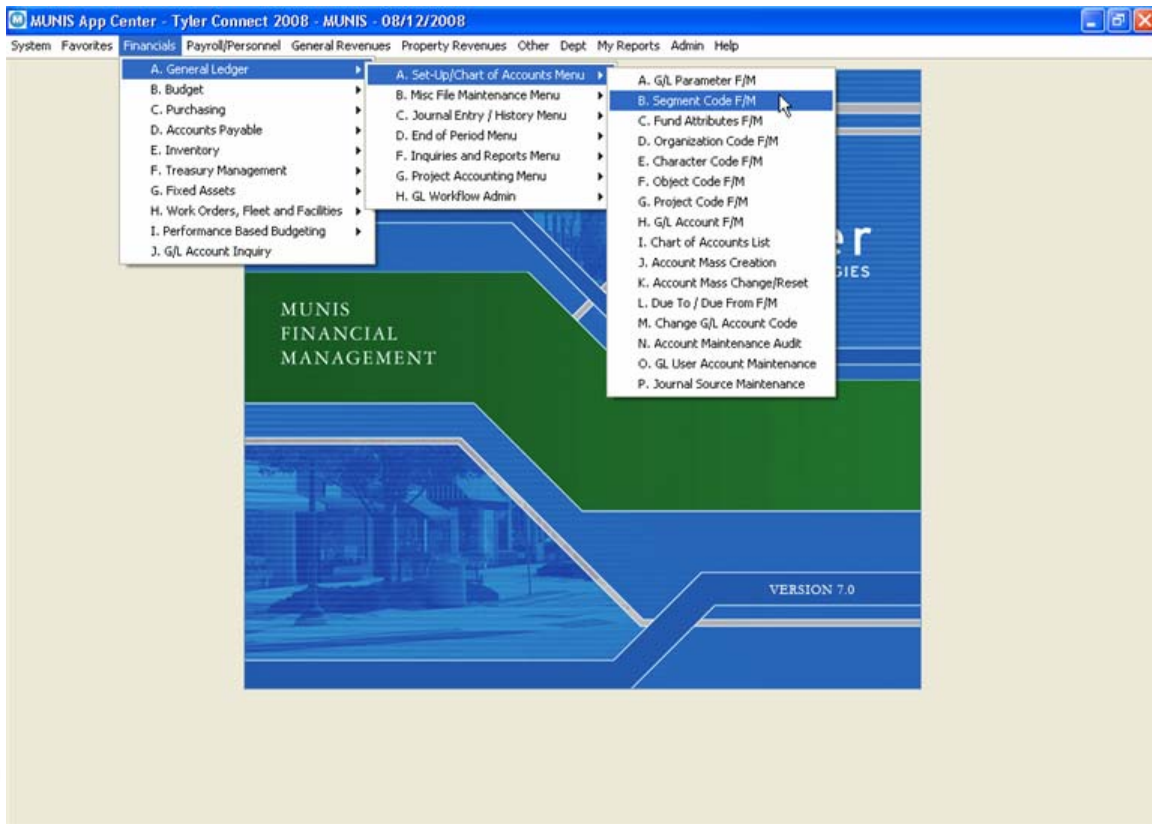


FIGURE 9

“Pull-down” Menu

The “pull-down” style is horizontally aligned across the top of the screen and can be seen Figure 9. In this case, the menu system cascades as each selection is made. The menu disappears once a selection is made.

Choosing a Menu Style Preference

Path: Main Menu->Dept->Menu Personal Preferences

Path: My Menu->Menu Personal Preferences

Style choices are under the user’s control within the “Menu Personal Preferences” program. It allows the user to associate a particular style with each supported menu type (Figure 10).

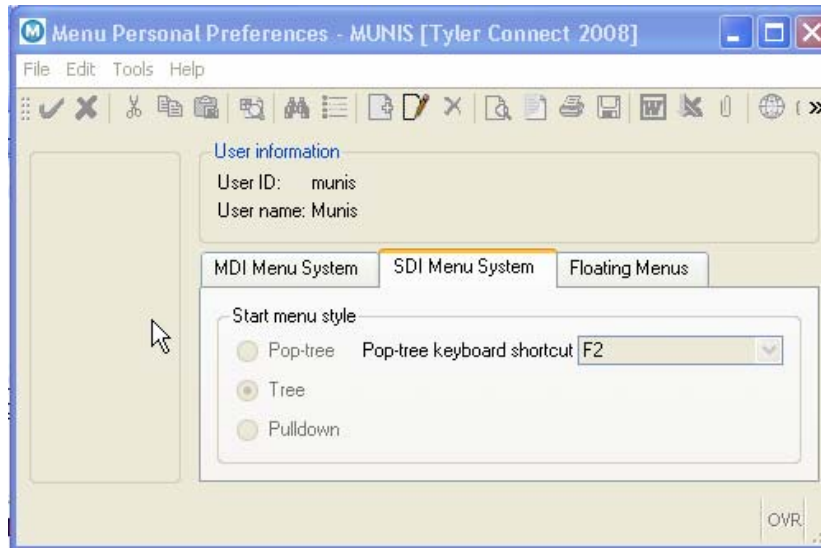
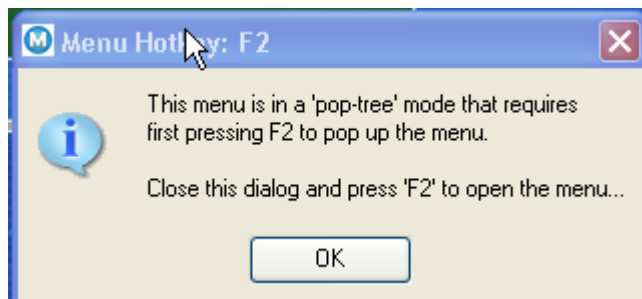


FIGURE 10

Selection of the Pop-tree style necessitates closing the MUNIS application, launching the MUNIS application and using the Pop-tree keyboard shortcut to launch the Pop-tree menu.



Section 3 Menu Maintenance/Setup – Menu Customization

Following login authentication, menu customization is the most powerful method of controlling access to the MUNIS system. MUNIS has the ability to serve each user role with a customized menu that shows only those functions that fall within the role's domain.

Custom menus can be created by grouping together various MUNIS programs all under one menu. The following is an example of a customized menu for a payment entry clerk. The payment entry clerk role needs to access ONLY the following programs/options:

Payment Entry
Bill Inquiry
Parcel FM
UB Account Customer Inquiry
Customer FM
MUNIS website

Since these programs are located on different menus within MUNIS, we will create a custom menu for the payment entry clerk role. Menu customization begins at the Menu Maintenance/Setup screen as shown in Figure 11.

Path: Main Menu ->Admin->General Admin->Menu Maintenance/Setup>Menu Design Tab

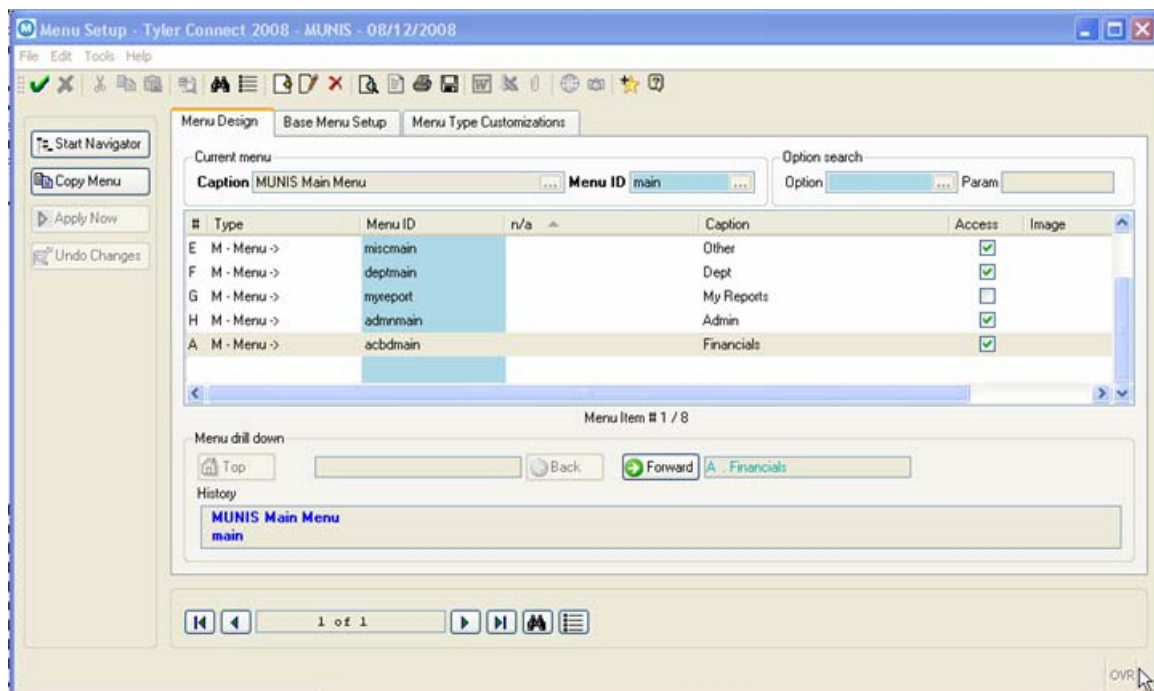


FIGURE 11

Creating a Custom Menu

Custom menus can be created by using the program “Menu Maintenance/Setup” as shown in Figure 12. This allows maintenance on existing MUNIS menus as well as the creation of role-specific menus. To create the custom menu “Payment Entry Clerk” menu, we will use the following programs/options:

PROGRAM ID	CAPTION
arcshrect	Payment Entry
arbilingq	Bill Inquiry
txremast	Parcel FM (inquiry only)
ubcstinq	UB Account Customer Inquiry
arcstmnt	Customer FM

Path: Main Menu->Admin->General Admin->Menu Maintenance/Setup>Menu Design Tab

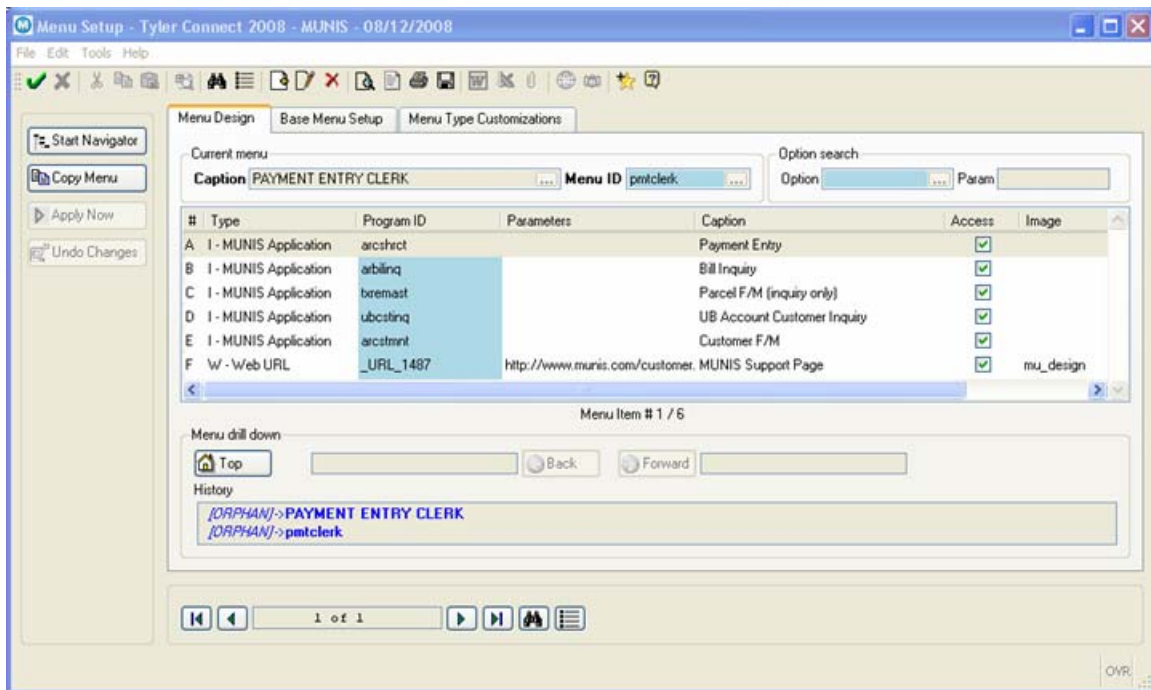


FIGURE 12

The menu id of “pmtclerk” depicted in Figure 12 can be tied to any role in the system. It would restrict access to the functions listed, namely Payment Entry, Bill Inquiry, Parcel FM, UB Account Customer Inquiry, Customer FM and the MUNIS Website.

Menu Security

MUNIS also offers menu security within any menu; this functionality resides within Admin>Security>Role Maintenance.

Main Menu>Admin>Security>Role Maintenance

The screenshot shows the 'Role Maintenance - MUNIS [Tyler Connect 2008]' window. The 'Menu Security' tab is selected, showing a table of menu items for the 'MUNIS Main Menu'. The table has columns for Access, #, Type, Caption, Prg/Menu, and Parameters. The 'Access' column contains checkboxes, and the 'Caption' column lists menu items. The 'Prg/Menu' column lists the corresponding program or menu name. The 'Parameters' column is empty. The table shows 8 items, with the first item (Financials) having an unchecked checkbox, and the others (Payroll/Personnel, General Revenues, Property Revenues, Other, Dept, My Reports, Admin) having checked checkboxes. Below the table are 'Select All' and 'Deselect All' buttons, and a '1 / 8' indicator. The window also shows a 'Role' section with 'Role Key' set to 'MUNIS', 'Role status' set to 'Active', and 'Last updated' on '08/12/2008 at 12:55:41'. The 'Menu access' is set to 'MUNIS Main menu'.

Access	#	Type	Caption	Prg/Menu	Parameters
<input type="checkbox"/>	A	M - Menu ->	Financials	acbdmain	
<input checked="" type="checkbox"/>	B	M - Menu ->	Payroll/Personnel	hmain	
<input checked="" type="checkbox"/>	C	M - Menu ->	General Revenues	grvmain	
<input checked="" type="checkbox"/>	D	M - Menu ->	Property Revenues	prvmain	
<input checked="" type="checkbox"/>	E	M - Menu ->	Other	miscmain	
<input checked="" type="checkbox"/>	F	M - Menu ->	Dept	deptmain	
<input checked="" type="checkbox"/>	G	M - Menu ->	My Reports	myreport	
<input checked="" type="checkbox"/>	H	M - Menu ->	Admin	adminmain	

FIGURE 13

This allows each role to be married to specific MUNIS menus and then for each function contained within the menu to be toggled on/off. Figure 13 is an example of the “Menu Security” function for typical MUNIS role. An unchecked function is not available to the user. In this particular example, when role “MUNIS” is presented with the MUNIS MAIN MENU, the Financials menu selection will NOT show. There is no need to restrict access on the menus that a role cannot view.

Launching Non-MUNIS Applications From The Menu System

The MUNIS menu system is versatile in that it allows the user to open Microsoft Office Documents, link to Websites, run batch programs, and launch Crystal reports in addition to executing MUNIS programs.

Path: Main Menu->Admin->General Admin->Menu Maintenance/Setup>Menu Design Tab

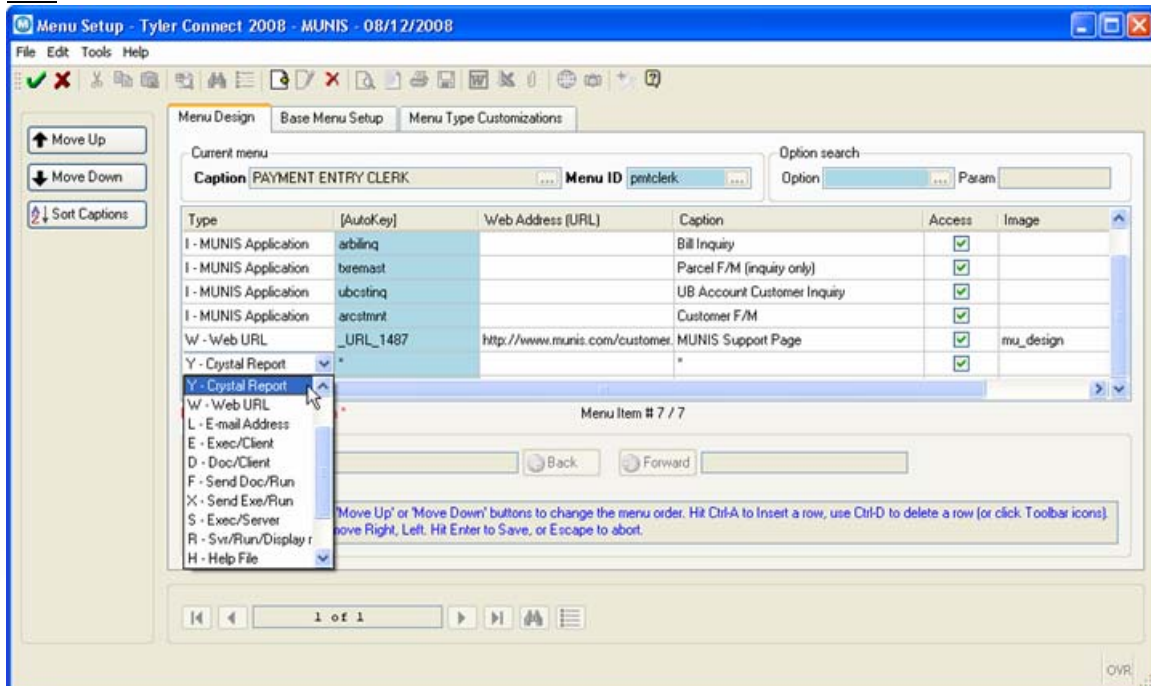


FIGURE 14

The key to launching a non-MUNIS program is selecting the proper executable type. The drop-down list as shown in figure 14 identifies the choices that are available in version 7.

If the menu pick is an executable program (i.e. .exe, .bat. or .cmd), set the type as Exec/Client and reference the absolute path to the program under parameters. A free-form description for the program can be referenced in the caption field and will be displayed on the run-time version of the menu.

Any PC-based document can be opened from the menu system using a similar setup to the one above with one distinction. The parameter field must specify the absolute path to the root program followed by an absolute path to the document itself. For example, if an Excel spreadsheet named usercon.xls were to be opened, the parameter line would have to specify exactly where the Excel program was located on the computer coupled with the exact location of the spreadsheet itself.

A Crystal report can be launched by selecting the menu type as Y- Crystal Report and specifying the desired Crystal report from the drop-down list.

Likewise, a linking to a website can be accomplished by selecting the menu type as W- Web URL and specifying the uniform resource locator (URL) in the parameter field.

Path: Main Menu->Admin->General Admin->Menu Maintenance/Setup>Menu Design Tab

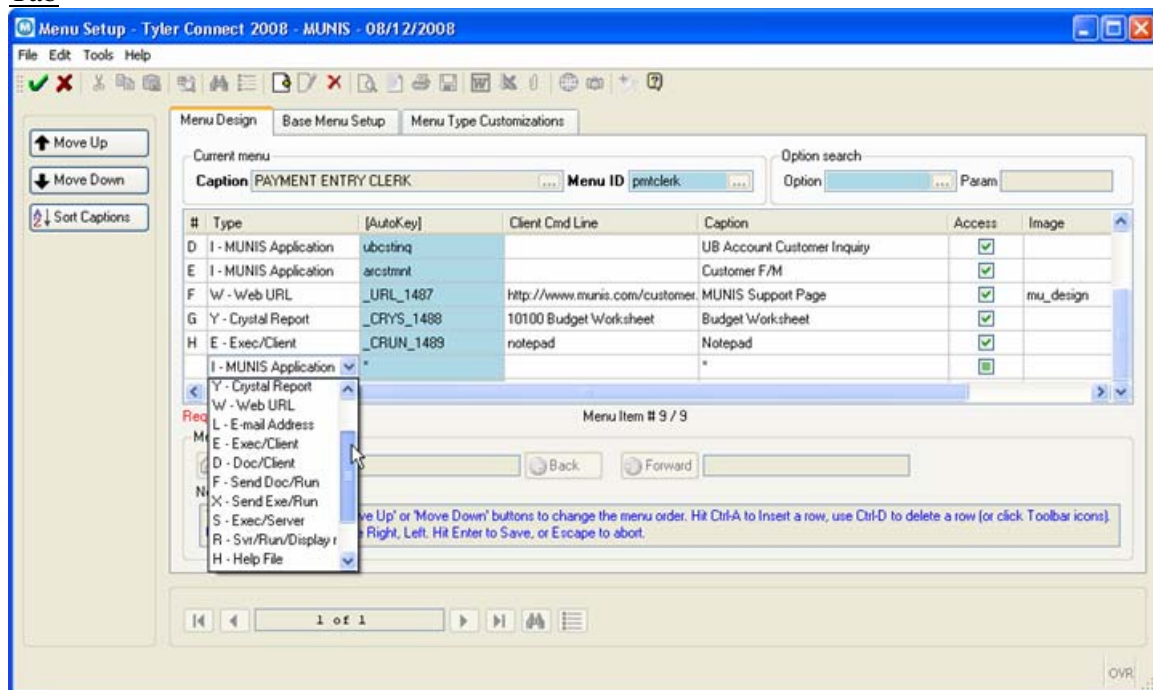
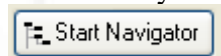


FIGURE 15

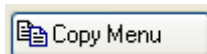
The “Menu Maintenance” program exhibited in Figure 15 demonstrates an existing menu that has been modified to execute the functions mentioned previously.

Additional Menu Setup Options

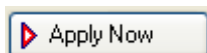
Additional menu options are available in the Menu Maintenance/Setup screen. The Menu Design Tab allows for the creation of custom menus as well as the following functionality:



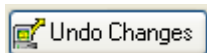
The Start Navigator button will launch a floating Navigator menu that will allow access within the Menu Design Tab to any of the selected menu items in the Navigator window.



The Copy Menu button will allow the copy function of the current menu.

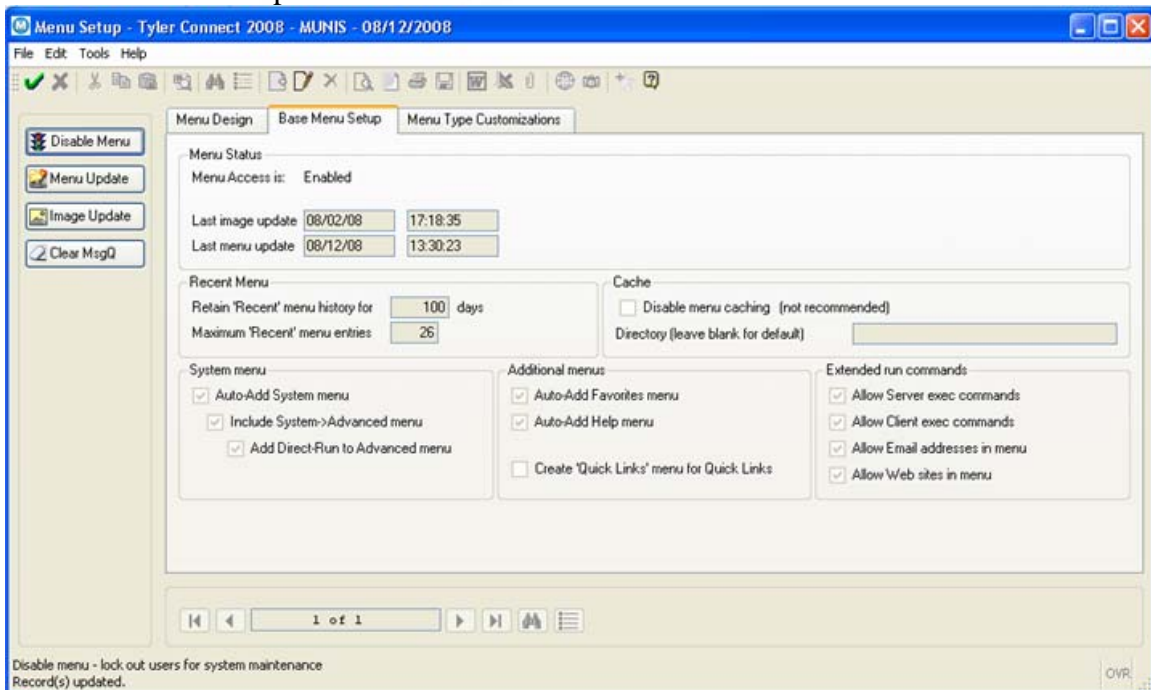


The Apply Now button will apply the changes made to the current menu.



The Undo Changes button will undo any changes made to the current menu.

The Base Menu Setup Tab



Menu Status

Menu Access is - This indicates if the menu access is enabled or disabled.

Last image Update - This is the date and time that images were last updated.

Last Menu Update - This is the date and time that menus were last updated.

Recent Menu

Retain 'Recent' Menu History For - This is the number of days of user history to be stored. For new installations for the MDI menu, the default value is 1. When using the MDI menu, it is important to keep the value of this box at a low number to preserve system resources. Type **0** to disable history and the System->Recent option.

Maximum 'Recent' Menu Entries - This box displays the maximum number of submenu entries allowed: 0 to 26, inclusive. The numbers correspond to the letters A through Z.

Cache

Disable Menu Caching (Not Recommended) - This check box directs the program to disable menu caching. This is not recommended. If disabled, users may notice delays in processes and commands, and some features may not work properly.

Directory (Leave Blank for Default) - This box specifies a menu cache directory. Leave this box blank to use the default directory, which is the directory that MUNIS personnel recommend.

System Menu

Auto-Add System Menu - This check box directs the program to display the System menu in the main MUNIS menu

Include System->Advanced Menu - This check box directs the program to display the Advanced submenu in the System menu.

Add Direct-Run to Advance Menu - This check box directs the program to add the Direct Run option to the Advanced submenu.

- Direct Run is a MUNIS feature that allows you to call a program using its 8-character program name. If the Add Direct Run to the Advanced Menu check box is selected in the Menu Maintenance/Setup program, the Direct Run menu item is included in the System/Advanced menu.
- For individual system users, the Direct Run feature is only available if they have a role assignment that has the Access to Direct Run menu check box selected on the MUNIS Systems Role Maintenance screen in Role Maintenance. General users do not have access to the parameter enhancement.

Additional Menus

Auto-Add Favorites Menu - This check box directs the program to include the Favorites menu on the main MUNIS menu. When a user adds Favorites, there is a delay equivalent to the idle-polling time set in the Menu Idle-Polling Delay in Seconds box. Users must remain idle for the value specified in this box before the item appears in Favorites. This is also true when a user selects Exit from the System menu.

Auto-Add Help Menu - This check box directs the program to add the Help menu to the main MUNIS menu. The Help menu provides users with access to documentation, useful e-mail, and Web addresses.

Create 'Quick Links' Menu for Quick Links - When this check box is selected, any Quick Links menus are placed under a top-most 'Quick Links' menu. When this check box is cleared, any Quick Links menus are placed on the top menu level.

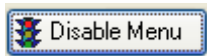
Extended Run Commands

Allow Server Exec Commands - This check box directs the program to add server commands to the Advanced menu. These commands enable users to open a background screen on the client workstation that runs outside of the MUNIS software, but that is part of the MUNIS system.

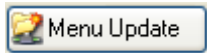
Allow Client Exec Commands - This check box directs the program to enable client commands in the menu.

Allow E-mail Addresses in Menu - This check box directs the program to enable e-mail addresses in the menu.

Allow Web Sites in Menu - This check box directs the program to enable Web sites in the menu types.



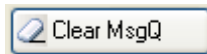
The Disable Menu button - **Caution!** This option should only be used during system maintenance downtime as it locks all users out of the selected menu. Do not select this option unless you have a means to re-enable the menu.



The Menu Update button will force users to rebuild their menus the next time that MUNIS is run. The menu cache directory is cleared.

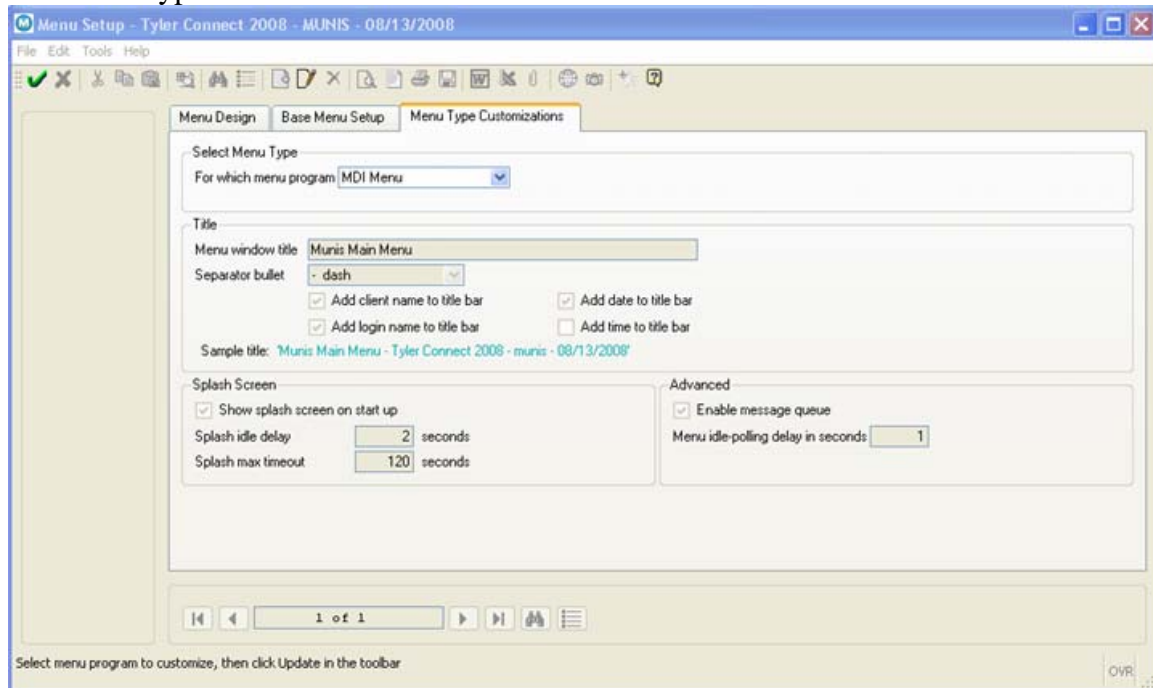


The Image Update button will force an update of images used by the MUNIS® system. When you select this option, images on users' systems are updated the next time they log in to the MUNIS system.



The Clear MsgQ button will clear the message queue during system maintenance when no users are accessing MUNIS programs. When you select this option, the program displays a confirmation message.

The Menu type Customization Tab



Select Menu Type

For Which Menu Program - This is the menu program to setup.

The options are as follows:

- The MDI Menu is the most common menu program. It is a parent/child structure; each program (child) is launched and contained in the same window (parent).
- The SDI Menu is a MUNIS application center. Each program is launched in a separate window, functioning as if it were its own application. When more than one program is open, this menu enables you to toggle between applications (programs) by pressing Alt+Tab.
- A notation next to the box indicates whether the program is enabled.
- Click Refresh to see the changes you have made.

Title

Menu Window Title - This is the menu name or title that should appear in the title bar of the MUNIS system. The name can contain up to 64 characters.

Separator Bullet - This is the type of delimiter to use when program titles are appended.

Add Client Name to Title Bar - This check box directs the program to display the company name in the title bar. The company name displays as entered in System Parameters FM.

Add Login Name to Title Bar - This check box directs the program to display the employee's user ID if he/she is currently logged into the MUNIS system.

Add Date to Title Bar - This check box directs the program to display the current date in the title bar. Polling must be enabled for the date option to be functional.

Add Time to Title Bar - This check box directs the program to display the current time in the title bar.

Splash Screen

Show Splash Screen on Start Up - This check box directs the program to display a splash screen during a menu rebuild.

Splash Idle Delay - This is the number of seconds that the splash screen should delay before checking to see if the menu has been rebuilt.

Splash Max Timeout - This is the maximum number of seconds to display the splash screen, regardless of polling, before the splash screen times out.

Advanced

Enable Message Queue - This check box directs the program to enable menu application messages.

Menu Idle-Polling Delay in Seconds - This is the number of seconds to delay before a menu checks for background events. Polling makes a data link library call that keeps users' menus refreshed. Polling does not clear the cache. The default and recommended value for this box is 1. If the value is greater, it may cause noticeable delays in updating commands, such as when users add a program to their Favorites menu.

Custom Menu NOTES:

A software release or update overwrites changes you have made to the menus. You are responsible for fixing changes to the menus that result from these updates. MUNIS personnel urge you to print/store a copy of the menus, and then reconfigure the menus after the release/update is complete. New programs are not placed on the menus by default. To add new programs to the menus, you must grant users access.

- When you add new menus, the program ensures that the ID defined for the menu does not match the ID of a program that currently exists.
- In order to ensure that your custom menus remain compatible with future releases of new MUNIS programs, MUNIS personnel recommend that if you create new custom menu IDs, you create IDs with 7 characters or less.
- To configure the menus for specific users, use Role Maintenance.
- You can use custom splash screens or other images with Genero® desktop computers (GDCs).
 - For Linux® and UNIX® servers, place images in the \$MU_ROOT/images_suppl directory
 - For Windows® servers, place the images in the %MU_ROOT%\images_suppl directory.
 - Once you have stored the images, you can access them in Menu Setup by clicking Image Update. When you click this button, the program displays the following message: "This option will force an update to the MUNIS image library on all users' workstations. This will occur the next time each user runs their menu. Are you sure you want to force an image update?" Click Yes to continue.

- The supplemental images directory must be named the same as the standard images directory but with "_suppl" added at the end. It must also exist in the same parent directory as the standard images directory and should have the same permissions.
- Valid image extensions for the image_suppl directory are .gif, .jpg, .png, .ico, and .bmp. All other file types are ignored. Because these images are transferred from the server to the user's workstation, be aware of how transferring larger files may affect the network (for example, you may not want to transfer a 1-MB bitmap file).

Section 4 AUTO-UPDATE OF CLIENT SOFTWARE

MUNIS is a client-server application. In addition to updating the server-side forms and programs, there is also an occasional need to update the client side. MUNIS contains a mechanism to automatically push out client updates without the need to visit each and every client machine.

The System Parameter table shown in Figure 16 contains a System Admin tab.

Path: Main Menu->Admin->General Admin->System Parameter>System Admin Tab

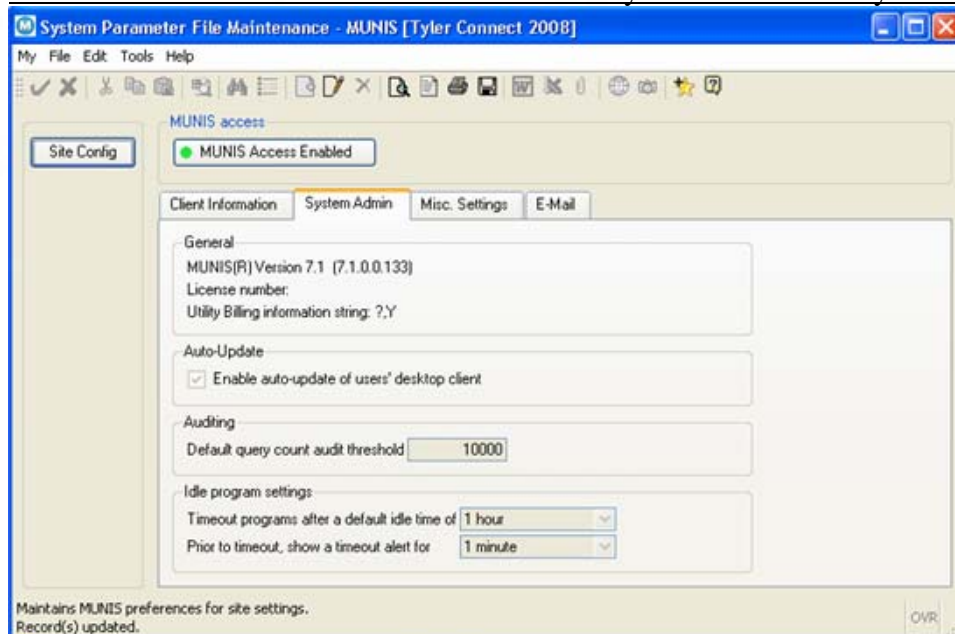


FIGURE 16

The Auto-Update check box directs the client software to automatically update itself whenever a change is warranted. The affected client will receive a pop-up message indicating that the client software is being updated. In all, the process takes approximately 30 seconds. This parameter is a universal setting that will be applied to every client machine within the environment. It cannot be turned on and off on a user-by-user basis.

Section 5 AUTO LOGOFF OF MUNIS SESSIONS

Perhaps the most frustrating aspect of administering any system is the requirement that a user logoff the system when not using it. No matter how many times users are reminded, inevitably each and every night, there will be a list of users that have gone home for the evening without terminating their sessions. Not only is this a security threat, it also ties up precious licenses and can hold up nighttime processes like backup and refreshes.

MUNIS has a built-in time-out feature that can be set universally and overridden at the user level. Figure 16 illustrates the System Admin tab of the System Parameter table.

Path: Main Menu->Admin->Security->Role Maintenance>MUNIS System>System Admin Tab

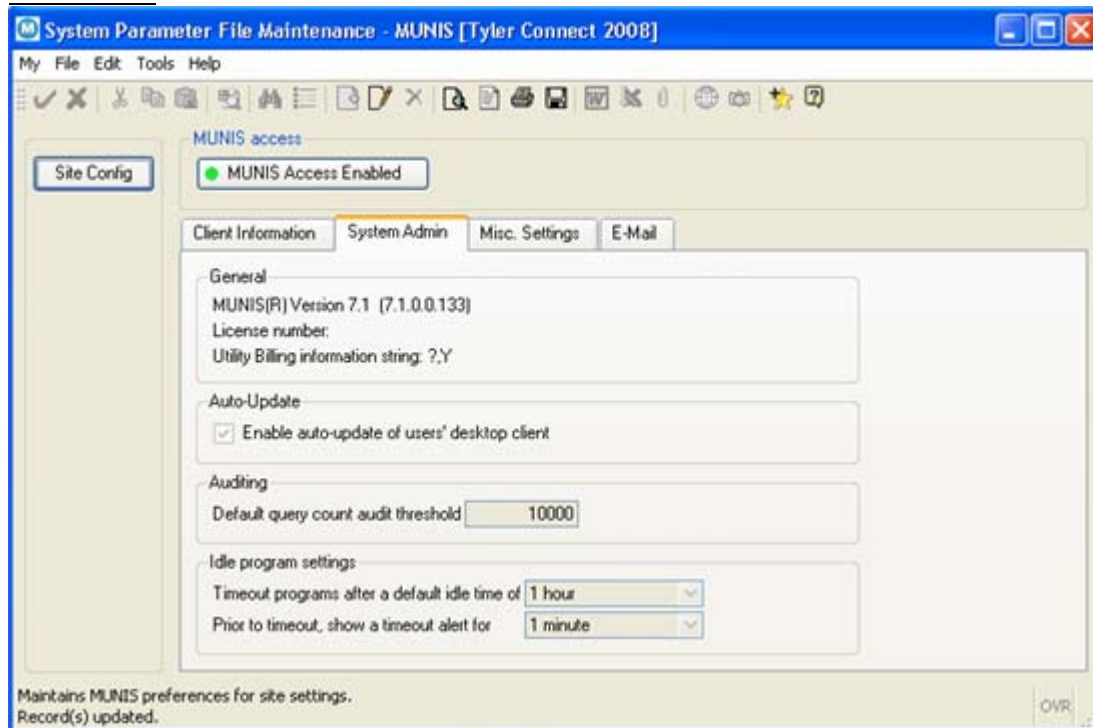


FIGURE 16

Note that there are two parameters under the Idle Program Settings. The first instructs MUNIS how long to wait to sever its connection with the client in the event of no activity. In this case, no activity implies that no keystrokes have been logged on the keyboard, and the mouse has remained stationary. The second instructs MUNIS how long to display an alert message in the event of an impending timeout.

The program timeout alert lets the user know the idle time remaining before the system will close the program. The settings here are universal and can be applied across the entire user base.

Should the need arise to grant certain users exceptions to this rule, MUNIS supports this as well. Figure 17 illustrates how a user can be exempted from the global rule.

Path: Main Menu->Admin->Security->Role Maintenance>MUNIS System

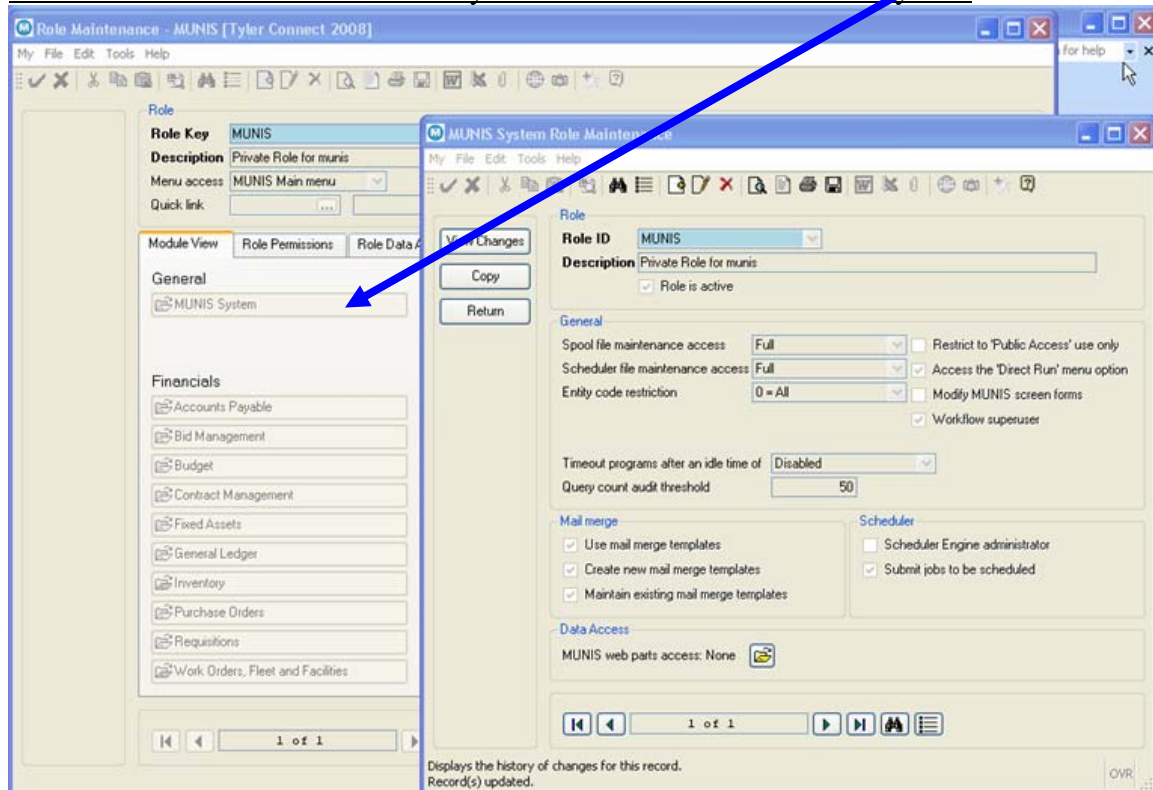


FIGURE 17

Section 6 MANAGING USER QUERIES

Query Audit Count Threshold

Much of MUNIS' power comes from its inherent ability to find on almost any field or combination thereof. Coupled with this power is the risk that a user may request a find that returns every record in a very large table. Whether intentional or accidental, these types of queries can place a processing burden on the entire system. MUNIS provides the ability to monitor these exceptional queries. Figure 16 illustrates the System Admin tab of the System Parameter table.

Path: Main Menu->Admin->Security->Role Maintenance>MUNIS System>System Admin Tab

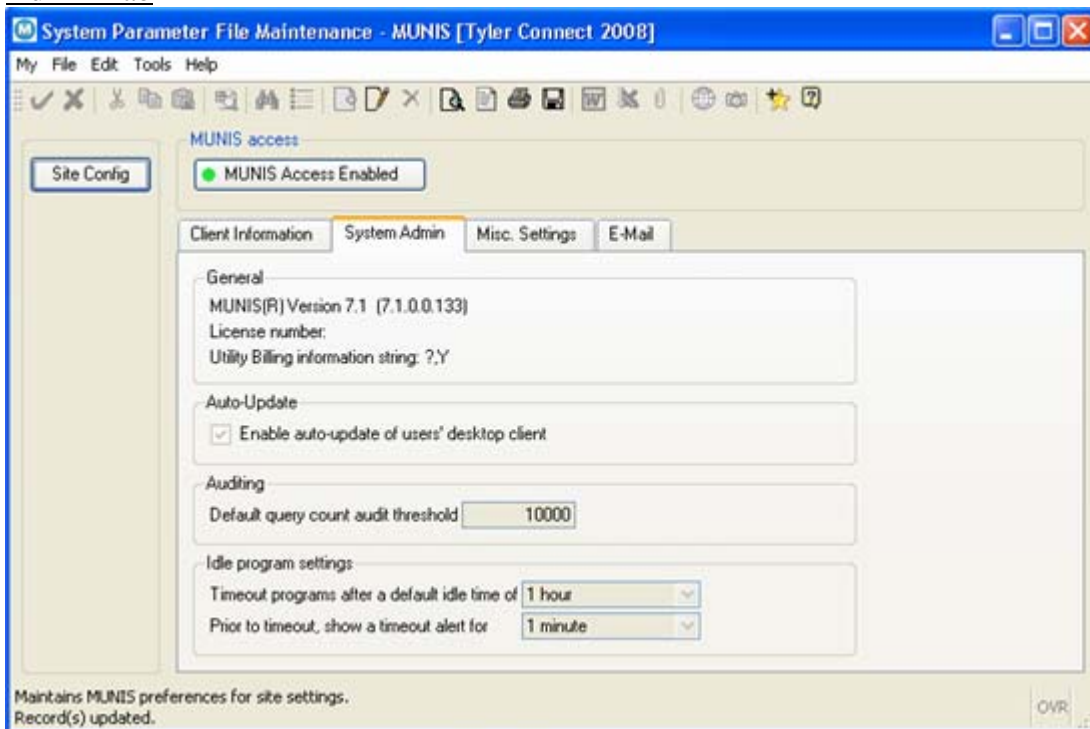


FIGURE 16

In Figure 16, the Query Count Audit Threshold is set at 10,000. In other words, any query that returns more than 10,000 rows will be logged in an audit trail.

While the setting indicated is universal, it can be overridden at the user level as illustrated in Figure 17. In this example, the user “MUNIS” has a limit of 50 records.

Path: Main Menu->Admin->Security->Role Maintenance>MUNIS System

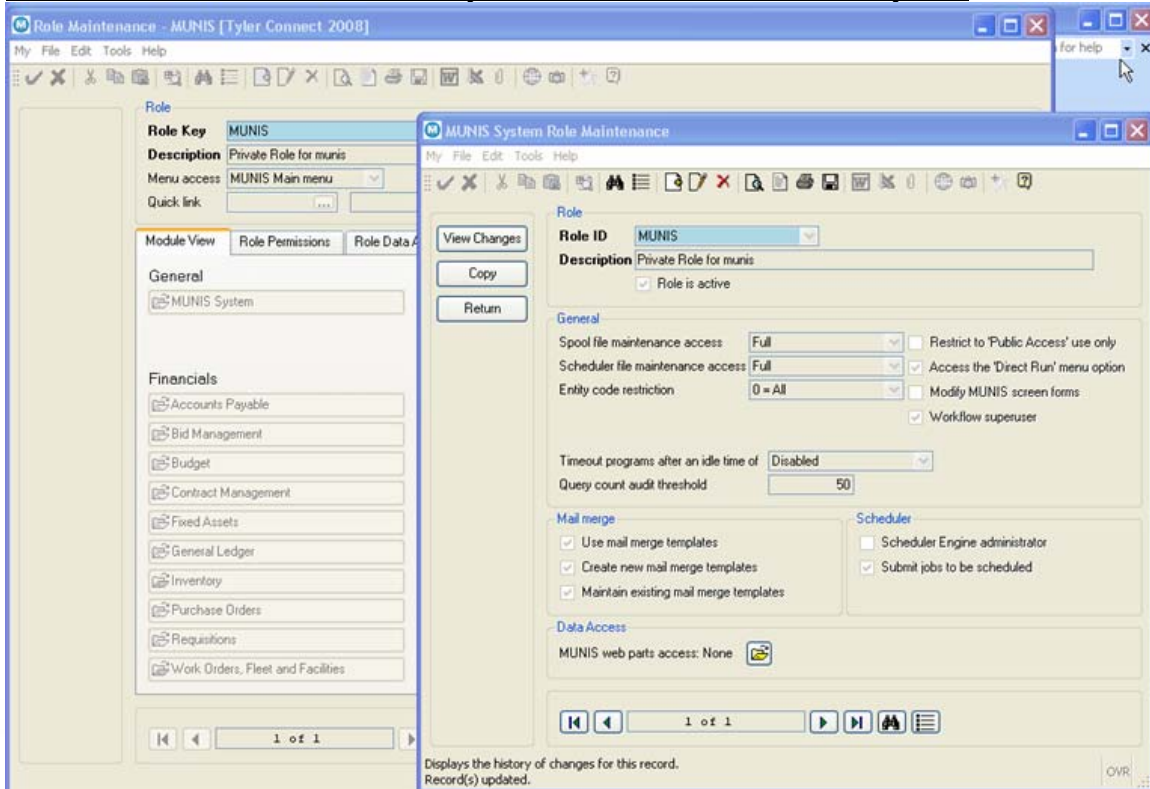


FIGURE 17

Queries that exceed the established threshold are logged in an audit trail. Violations can be accessed via the Query Audit Display/Purge Program.

Query Audit Display/Purge

Path: Main Menu->General Admin->Query Audit Display/Purge

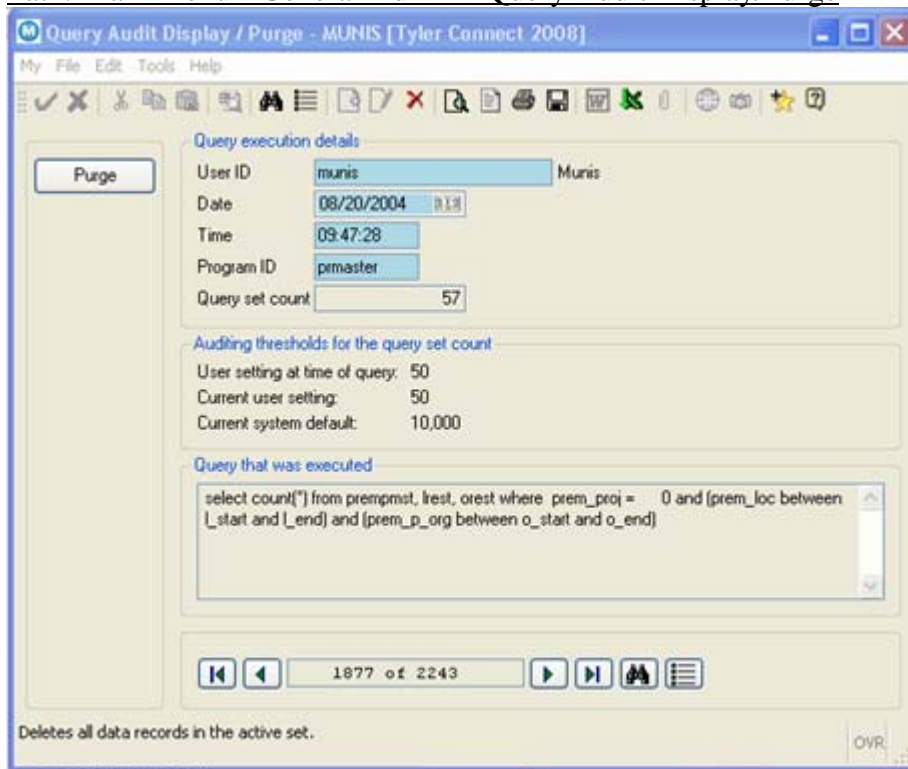


FIGURE 18

As Figure 18 illustrates, the log contains a user stamped, date stamped, and time stamped violation log that details not only the size of the find set requested by the user but also the query syntax that extracted the data.

Section 7 MONITORING THE ERROR LOG

Database and system errors are logged in the MUNIS Error Log. While the presence of records in the error log are not in and of themselves alarming, certain trends can be considered indicative of problems. The real issue here is to analyze trends such as a growth in errors on a day-by-day basis or a large number of errors that can be attributed to a certain role or program.

Figure 19 displays the error log table. All the fields in the table are searchable making it easy for the administrator to cull out errors by day or user.

Path: Main Menu->General Admin->Error Log Display/Purge

Activity stamp

Date: 08/11/2008
Time: 17:06:47
Program ID: arncrpt
User ID: munis

Logged error activity

Internal message: ghistry data error, 2006 6 16
Status error: 0
ISAM error: 0

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Deletes all data records in the active set.

FIGURE 19

The log is stored in a table named sperrlog, Figure 20. Selecting the Display icon will display a table view of the errors.

Date	Time	Prog ID	User ID	User Name	Internal Message
08/11/2008	17:23:01	aircnrpt	munis	Munis	ghistry data error: 2006 6 17
08/11/2008	17:23:00	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:22:59	aircnrpt	munis	Munis	ghistry data error: 2006 6 16
08/11/2008	17:22:58	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:19:16	aircnrpt	munis	Munis	ghistry data error: 2006 6 17
08/11/2008	17:19:15	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:19:14	aircnrpt	munis	Munis	ghistry data error: 2006 6 16
08/11/2008	17:19:13	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:08:16	aircnrpt	munis	Munis	ghistry data error: 2006 6 17
08/11/2008	17:08:15	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:08:14	aircnrpt	munis	Munis	ghistry data error: 2006 6 16
08/11/2008	17:08:13	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:06:49	aircnrpt	munis	Munis	ghistry data error: 2006 6 17
08/11/2008	17:06:48	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	17:06:47	aircnrpt	munis	Munis	ghistry data error: 2006 6 16
08/11/2008	17:06:46	aircnrpt	munis	Munis	Insert tmpgl(400): -391
08/11/2008	14:25:30	bgamdent	munis	Munis	wfnxtp3 spemail send failed.
08/11/2008	14:25:29	bgamdent	munis	Munis	A timeout was reached contacting e-mail
08/11/2008	14:23:45	bgamdent	munis	Munis	wfnxtp3 spemail send failed.
08/11/2008	14:23:44	bgamdent	munis	Munis	A timeout was reached contacting e-mail

FIGURE 20

The table sperrlog is accessible via Crystal Reports, which in turn gives the administrator the ability to create graphical reports detailing the frequency of errors by date, role, or program.

Section 8 SECURITY FEATURES

MUNIS utilizes role based security whereby each module has a series of binary propositions that either allow or disallow a user the right to use certain functionality. Moreover, users can be reigned in to certain general ledger segments, payroll departments, or receivable codes. These features are well documented and beyond the scope of this presentation. Instead, the focus will shift onto two lesser-used aspects of the MUNIS security system.

Password File Maintenance

MUNIS Password File Maintenance has existed for more than a decade, yet it is rarely used. With the 2005 release, however, this program has become commonplace. The MUNIS Workflow Engine has been rewritten to utilize web services and consequently, the password file has been chosen as the authentication mechanism. The MUNIS Password File is presented in Figure 21.

Path: Main Menu->Admin->Security->System Passwording Maintenance

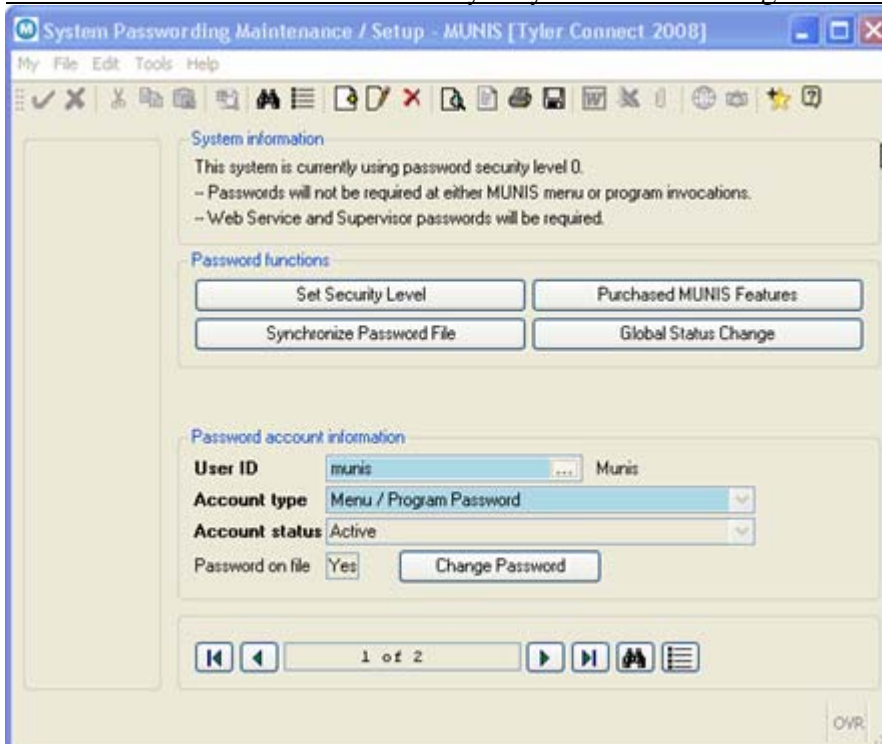
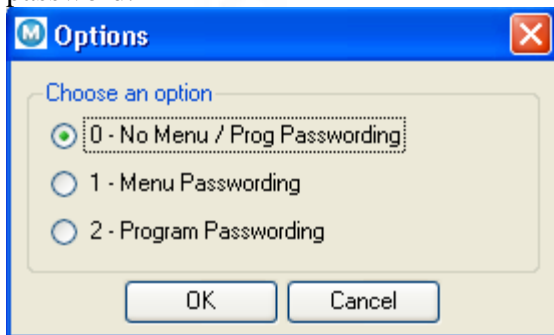


FIGURE 21

The button labeled “Set Security Level” allows the administrator to prompt users for passwords whenever a menu is opened or program is launched. The password used here can be exclusively for MUNIS and separate and distinct from the operating system password.



When this functionality is activated, every MUNIS user would have to exist within the password table.

To aid in the setup, the administrator is provided the “Synchronize Password File” button.

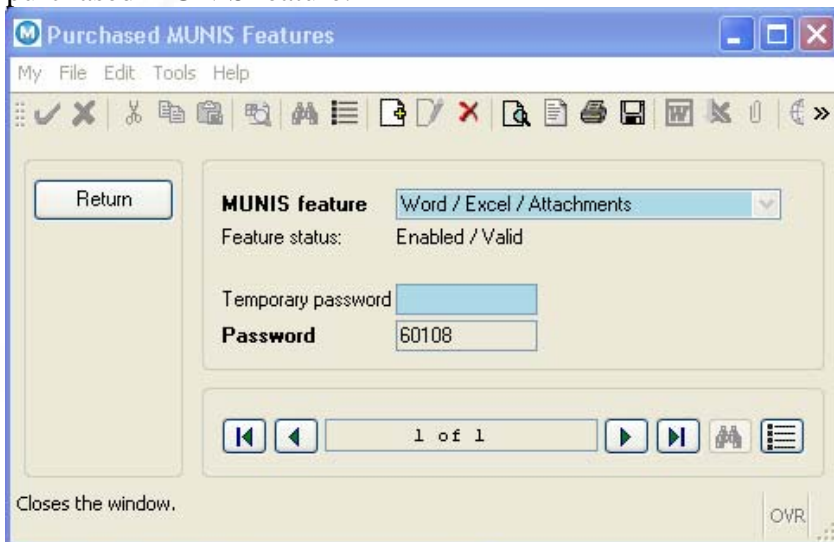


This will use the User Id Permissions table to create a unique user record in the Password table.

Passwords can be expired or inactivated at will by using the “Global Status Change” button.



The Purchased MUNIS Feature functionality will allow the system administrator to use a temporary license and password to try a MUNIS module or to assign a password to a purchased MUNIS feature.



Lock Out Users

Occasionally, it becomes advantageous to keep all users off the system. This is especially true during the installation of releases or year-end closes.

Path: Main Menu->Admin->General Admin->System Parameter

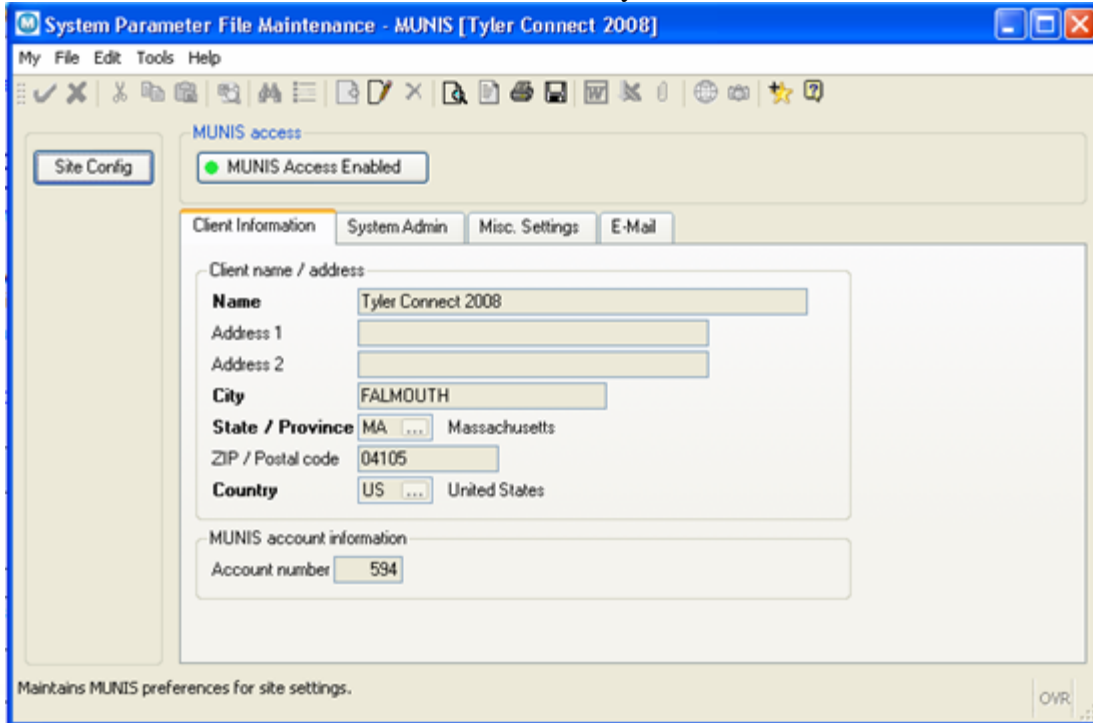
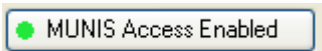
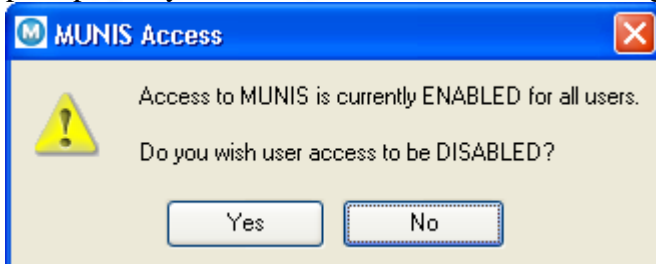


FIGURE 22

The System Parameter File Maintenance screen shown in Figure 22 contains functionality that will lock out all users of the system with the exception of the “munis” user.

By clicking the button , all users will be prevented from accessing the system with the exception of the “munis” user. The MUNIS system will prompt the system administrator with the following message:



It should be noted that this access rule is only activated upon login. For example, if a user is running MUNIS when this button is activated, their session would not be disturbed. Only after logoff and subsequent login would the user experience the lock out. When MUNIS access is disabled, the user will be greeted with a message stating that the System Administrator has disabled the system.

Section 9 CONFIGURING LOCAL AND REMOTE PRINTERS

Once a print queue has been successfully created within the operating system, it needs to be established with MUNIS. MUNIS utilizes the Printer Definition Table shown in Figure 23 to establish every valid printer within the system.

Path: Main Menu->Admin->Printer/Device->Printer Definition FM

The screenshot shows the 'Printer Definition File Maintenance - MUNIS [Tyler Connect 2008]' window. It has a menu bar (My, File, Edit, Tools, Help) and a toolbar. The main area is divided into several sections:

- General printer information:** Contains fields for 'Printer ID' (LAUR), 'Printer name' (LAURIE'S PRINTE), 'Print command' (nlp -d "\\ccs_server\Fiery x3e"), 'Landscape mode' (empty), and 'Copies argument' (-n).
- Printer availability:** Contains radio buttons for 'Unavailable', 'Available to all users', 'Reserved for a user', and 'Reserved for a department' (selected). Below is a 'Reserved for user / dept' field with 'ENG' and 'ENGINEERING'.
- Additional printer arguments:** Contains three numbered text input fields (1, 2, 3).
- Scan line (OCR) control codes:** Contains 'Start' and 'Stop' text input fields, and a 'Print OCR Font Test' button.
- Miscellaneous:** Contains a 'User Assignments' button.

At the bottom, there is a status bar with navigation buttons and a page indicator '0 of 0'. A footer note says 'Enter any additional argument strings for this printer.' and a small 'OVR' button is in the bottom right corner.

FIGURE 23

Each printer is identified with a 1 to 4 alphanumeric code. The printer name is an “affectionate” name used to identify the printer in the organization.

The print command is operating system specific and beyond the scope of this presentation. By utilizing the printer availability functions, any MUNIS printer can be exclusively assigned to a user or department.

Section 10 MANAGING ATTACHMENTS

MUNIS allows users to attach third party files to their data records in a variety of places throughout the application suite. The administrator can manage the allowable file formats by using the Misc Code File Maintenance program shown in Figure 24.

Path: Main Menu->Admin->Miscellaneous Admin->System Misc Code F/M

System Misc Code File Maintenance - MUNIS [Tyler Connect 2008]

My File Edit Tools Help

View Changes

Miscellaneous code detail

Code type: AEXT - ALLOWED ATTACHMENT EXTENSIONS

Code: DOC

Description: MICROSOFT WORD

Short desc: MS WORD

Audit information

Entered by: [] on [11/2] at []

Last changed by: [] on [11/2] at []

1 of 14

Shows the history of changes for this record.

OVR

FIGURE 24

The browse screen shows examples of allowable file formats:

System Misc Code File Maintenance

File Edit Tools Help

Code Type	Code	Description	Short Desc
AEXT - ALLOWED ATTACHMENT EXTENSIONS	DOC	MICROSOFT WORD	MS WORD
AEXT - ALLOWED ATTACHMENT EXTENSIONS	EXE	EXECUTABLES	EXECUTE
AEXT - ALLOWED ATTACHMENT EXTENSIONS	HTM	HTML DOCUMENTS	HTML
AEXT - ALLOWED ATTACHMENT EXTENSIONS	JPG	JPEG IMAGES	JPEG
AEXT - ALLOWED ATTACHMENT EXTENSIONS	MDB	MICROSOFT ACCESS	MS ACCESS
AEXT - ALLOWED ATTACHMENT EXTENSIONS	POT	PORTABLE DOCUMENT FORMAT	PORT DOC
AEXT - ALLOWED ATTACHMENT EXTENSIONS	PPT	MICROSOFT POWER POINT	MS PWRPNT
AEXT - ALLOWED ATTACHMENT EXTENSIONS	RTF	MICROSOFT WORDPAD	MS WORDPAD
AEXT - ALLOWED ATTACHMENT EXTENSIONS	TXT	MICROSOFT NOTEPAD	MS NOTEPAD
AEXT - ALLOWED ATTACHMENT EXTENSIONS	VSD	MICROSOFT VISIO	MS VISIO
AEXT - ALLOWED ATTACHMENT EXTENSIONS	XLS	MICROSOFT EXCEL	MS EXCEL
AEXT - ALLOWED ATTACHMENT EXTENSIONS	ZIP	PKZIP	PKZIP
INID - INTERCHANGE ID QUALIFIER	01	DUNS (DUNS & BRADSTREET)	DUNS
INID - INTERCHANGE ID QUALIFIER	ZZ	MUTUALLY DEFINED	MUTUAL

Search / Filter

Record 1 of 14

OVR

All of attachments that are linked to MUNIS data records are stored in a central repository on the MUNIS server. Examining the run-time variables set by the MUNIS start script can identify this directory. These can be determined by launching the diagnostic utility (Section 12) as shown in Figure 25.

Path: Main Menu->Admin->General Admin->Diagnostic Utility

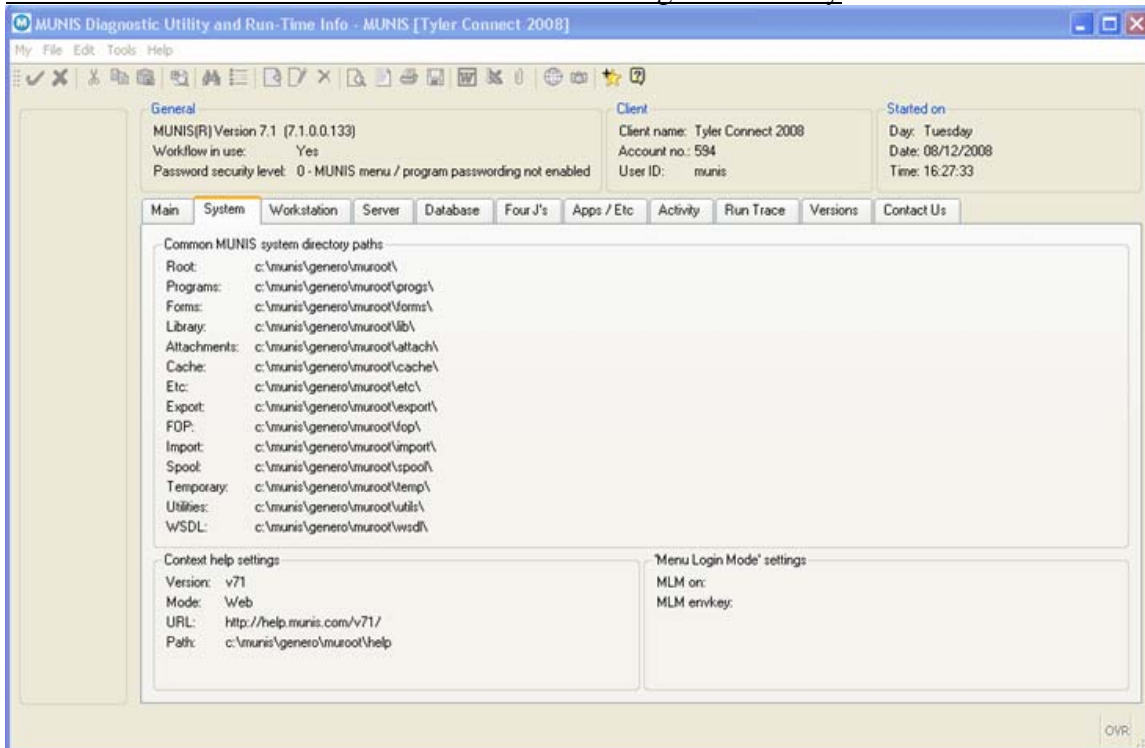


FIGURE 25

Attachments are cross-referenced between the data records and documents in a system table called spatattach. When the linkage is broken between an attachment and the data record, the user will receive an error that the attachment no longer exists.

Section 11 DIAGNOSTIC UTILITY

When a user is experiencing problems with a particular MUNIS program, it very often becomes necessary to run the program in debug mode. The MUNIS Diagnostic Utility does just that allowing all of the run-time variables, SQL statements, and debug traps to be captured to a data file that can then be emailed to Support for further analysis.

Figure 26 and 27 contains a snapshot of the debug utility. It should be noted that this program should only be run in conjunction with the MUNIS Support Department. Administrators should not take it upon themselves to execute this program.

Path: Main Menu->Admin->General Admin->Diagnostic Utility>Main Tab

The screenshot shows the 'Main' tab of the 'MUNIS Diagnostic Utility and Run-Time Info - MUNIS [Tyler Connect 2008]' application. The window has a menu bar (My, File, Edit, Tools, Help) and a toolbar. The 'General' section displays: MUNIS(R) Version 7.1 (7.1.0.0.133), Workflow in use: Yes, Password security level: 0 - MUNIS menu / program passwording not enabled. The 'Client' section displays: Client name: Tyler Connect 2008, Account no.: 594, User ID: munis. The 'Started on' section displays: Day: Tuesday, Date: 08/12/2008, Time: 16:27:33. The 'Support Wizard' section has a 'Support Call Number' field and a 'Please describe the problem:' text area. The 'Reporting Program' section shows: Program ID: N/A, Parameters: N/A, Screen form: N/A. There are buttons for 'Save Snapshots', 'View Snapshots', 'Standard Trace', and 'With SQL Debug'. A 'Run the program again in a 'trace' mode and try to reproduce the problem:' instruction is present. The 'Main' tab is selected in the bottom navigation bar.

FIGURE 26

Run Trace Tab

The screenshot shows the 'Run Trace' tab of the 'MUNIS Diagnostic Utility and Run-Time Info - MUNIS [Tyler Connect 2008]' application. The window has a menu bar (My, File, Edit, Tools, Help) and a toolbar. The 'General' section displays: MUNIS(R) Version 7.1 (7.1.0.0.133), Workflow in use: Yes, Password security level: 0 - MUNIS menu / program passwording not enabled. The 'Client' section displays: Client name: Tyler Connect 2008, Account no.: 594, User ID: munis. The 'Started on' section displays: Day: Tuesday, Date: 08/12/2008, Time: 16:27:33. The 'Run Trace' section has two large text areas labeled 'MU_DEBUG' and 'SQL_DEBUG'. Below these are input fields for 'Program ID', 'MU_DEBUG level' (set to 1), and 'SQL_DEBUG level' (set to 0), with a 'Go' button. A 'Gather trace information based on these options:' label is above the input fields. The 'Run Trace' tab is selected in the bottom navigation bar.

FIGURE 27

Section 12 AUDIT TRAILS

MUNIS maintains 25 audit trails scattered about the system. Each tracks a user-stamped, date-stamped, and time stamped transaction log of every change made to the database. The listing below gives an itemized list of each audit trail and the module it services.

Table Description

Alaudits	Animal Licenses
Apvdraud	Vendors
Arcstaud	Customers
Beaudits	Boats
Blaudits	Business Licenses
Bqcnautd	Bids, Quotes, and Contracts
Ceaudfil	Census
Gbinvaud	General Billing Invoices
Glbdaudt	Budget
Glmstaud	General Ledger
Itlnaudt	Inventory
Jsmstaud	Juror
Mvaudits	Motor Vehicle
Popuraud	Purchase Orders
Praudfil	Payroll
Prmaudit	Employee
Spaudfil	Utility Billing Runs
spaudqry	Query Size
spmaudit	Utility Billing
tslnaudt	Tax Sale/Lien
txbilaud	Tax Billing
txppmaud	Personal Property
txremaud	Real Estate
vtmstaud	Voter

As an example, the System Changes Audit screen shown in Figure 27, itemizes the actions have taken place.

Path: Main Menu->Admin->General Admin->System Changes Audit

System Changes Audit - MUNIS [Tyler Connect 2008]

My File Edit Tools Help

Purge

Key: MENU FILE MAINTENANCE

Key 2: Menu Option Added - pmntclerk

Record type: Choice D

Change date: 08/12/2008

Change time: 10:22:31

Changed by: munis

Action: Add

File: menutree

Field name: mm_choice

Old value:

New value: ubcsting Account Customer Inquiry

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Deletes all data records in the active set.

FIGURE 27

Additional applications that write to spmaudit table:

Accounts Payable
Accounts Receivable
Budgeting
Business Licenses
Bid Management
Contract Management
Fixed Assets
General Ledger
Inventory
Parking Tickets
Pension Tracking
Performance Based Budgeting

Permits and Code
Enforcement
Personnel Management
Project and Grant
Accounting
Property Tax
Purchase Orders
Requisitions
Risk Management
Slip Reservations
System
Utility Billing
Vehicle Registration
Work Orders, Fleet and
Facilities
Workflow

Application that write to field level audit tables outside of the spmaudit table:

Accounts Payable
Accounts Receivable
Animal Licenses
Applicant Tracking
Bid Management
Boat Excise
Budgeting
Business Licenses
General Billing
General Ledger
Jury Selection
Motor Vehicle
Payroll
Purchase Orders
Slip Reservations
Tax Delinquency
Vehicle Registration
Virginia Income Tax
Voter